WATER SUPPLIES.

(1) *Studies in Water Supply.* By Dr. A. C. Houston. Pp. xii+203. Macmillan's Science Monographs. (London: Macmillan and Co., Ltd., 1913.) Price 5*s.* net.

(2) *Water: its Purification and Use in the Industries.* By W. W. Christie. Pp. xi+219. (London: Constable and Co., Ltd., 1913.) Price 8*s.* 6*d.* net.

(1) DR. HOUSTON has gathered together an epitome of his own researches, which have been scattered among a considerable number of reports and papers. In the first chapter, which deals with sources of water-supply, he directs attention to the remarkably low death-rate from typhoid fever in London during the past few years, a rate which in the year 1911 amounted to only 0·03 per thousand of the population. After discussing the rivers Thames and Lea as sources of water-supply, he proceeds in subsequent chapters to give results of his observations upon the purification of water, finally concluding the volume by a discussion and description of the methods carried out under his direction in the laboratories of the Metropolitan Water Board.

The main conclusions which Dr. Houston draws from a large amount of experimental work may be summarised as follows:—River water exposed to manifold pollutions, and furnishing ample chemical and bacteriological evidence of objectionable contamination, may fail to show any or scarcely any of the microbes of water-borne disease; and he raises the question as to whether we have not exaggerated the value, high as it is, of the sand filter as a factor in our long-continued immunity from typhoid fever, and whether some at least of this freedom may not be due to the fact that the water was not primarily so noxious as it has hitherto been regarded. He is convinced that artificially-added typhoid bacilli die fairly rapidly in stored water, even when such water is of great initial impurity, and that a preliminary storage of water is an important factor of safety. This purification of water under storage conditions is chiefly due to the sedimentation, equalisation, and devitalisation of microbes; and he shows that by the second week the reduction in the artificially cultivated typhoid bacilli added to river water is more than 99 per cent. on the average, and that storage reduces the number of bacteria of all sorts and devitalises the survivors, if sufficiently prolonged.

Taking the chemical and bacteriological results together, Dr. Houston demonstrates that the beneficial effect observed in connection with simple continuous flow settlement of water may be considerably enhanced by the use of coagulants, such as aluminoferric, etc. He finds that when a hard water is overdosed with lime a considerable bactericidal effect is produced; and if after a suitable interval sufficient untreated water is added to combine with the excess of lime, a much safer water for drinking purposes is obtained. Speaking generally, these experiments demonstrate that the bactericidal dose of lime for hard waters would appear to be rather less than 1 to 5000, and with very soft waters 1 to 50,000. This method is especially attractive in cases where a water, bacteriologically impure, has in any event to be softened, and where a contaminated river supply has scarcely any available storage accommodation prior to sand filtration.

The author is to be congratulated, not only upon the good work to which the volume bears testimony, but also upon bringing it together in this monograph, and presenting it in a condensed and readable form.

(2) Mr. Christie's small work is mainly composed of a series of articles which appeared in "Industrial Engineering and Engineering Digest" for 1910-1911, and it is to be commended more particularly for its treatment of the use of water in various branches of industry. While much useful information is given upon the subject of the purification of water which would fit it for drinking purposes, this portion of the book is less satisfactorily dealt with than that which is concerned with the use of water for industrial purposes. Indeed, the treatment of the sources of water, its analysis and standards of purity, is fragmentary and unsatisfactory. It is impossible to deal with the subject of the standards of purity of water except in regard to the sources from which the water is derived. More particularly is this necessary with reference to chlorine standards; and the standard given for chlorine in water, of from 3 to 10 parts in a million, is useless and misleading. Extremely few of the drinking water supplies of this country would conform to such a standard. The chapters on water softening, pressure filters, oil filters, and boiler waters are the best contributions to a work which is exceedingly well produced, the illustrations being a noteworthy feature of the publication.

OUR BOOKSHELF.

From the Letter-Files of S. W. Johnson. Edited by his Daughter, Elizabeth A. Osborne. Pp. 292. (New Haven: Yale University Press; London: Oxford University Press, 1913.) Price 10*s.* 6*d.* net.

No teacher of agricultural chemistry can afford to do without Johnson's two books, "How Crops Grow," and "How Crops Feed." If he tries it,

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he will miss two most valuable sources of help for his lectures. The first was written in 1868, and instantly achieved a most remarkable popularity, being translated into French, German, Russian, Swedish, Italian, and Japanese, besides being revised and adapted for English readers by Church; the second appeared two years later, and was almost equally successful. Neither book is ever likely to get out of date, because each deals so fully with the fundamental experiments carried out by men who were laying the foundation of what has since become a great subject.

The book before us gives an account of the life of the writer of these books, and incidentally throws much interesting light on the opening chapters of the history of agricultural chemistry. Samuel William Johnson was born in 1831 at Kingsboro, in what was then the new country of Northern New York State. In 1849 he had saved enough to justify his entering Yale to study chemistry under Prof. J. P. Norton; from the outset he took a special interest in agricultural chemistry. Four years later (in 1853) he went to Leipzig to work under Erdmann, and then in 1854 to Munich to study under Liebig. He then came to England for a short time to study gas analysis at the Owens College, Manchester. On his return to New Haven he did a good deal of missionary work among farmers to demonstrate the enormous value of chemistry to the agriculturist, and became appointed chemist to the Connecticut State Agricultural Society in 1857. After eighteen years of work, the first agricultural experiment station in the States was founded; in the spring of 1875 the Legislature of Connecticut State passed a measure securing 700 dollars a quarter for two years for the maintenance of a laboratory placed at their disposal by the University at Middletown.

The history of these pioneer days is well told in Johnson's letters, and they make very interesting reading. The editor is to be congratulated on the way the material has been collected and arranged.

E. J. Russell.

The Cancer Problem: a Statistical Study. By C. E. Green. Third edition. Pp. 98 + plates. (Edinburgh and London: William Green and Sons, 1914.) Price 5*s*. net.

This book belongs to the all too numerous class of harmful publications on the subject of cancer. The author frankly states he is not a qualified medical man, but this fact will have little weight with the lay public. The sub-title, "A Statistical Study," conveys an entirely erroneous impression as to the scope of the book. It is in reality a plea for the infective nature of cancer, and of the active intervention of coal-smoke as an augmenter of the frequency of the disease. The alleged parasite is likened to the well-known *Plasmodiophora brassicae*, which causes finger and toe disease or club-root in turnips and cabbages. This vegetable parasite is not "almost unknown to pathologists," but has had its alleged claims to resemble a supposed cancer parasite discussed *ad nauseam* by pathologists and botanists of the highest repute. The author argues that coal-smoke manures the soil for this "cancer parasite."

The error of likening cancer to finger and toe disease has been often exposed. As for statistics, none are contributed by the author. His figures state the number of deaths from cancer as a percentage of deaths from *all* causes, and he marvels that 1 in 7 is from cancer in the Strand district, but only 1 in 54 in Stepney. This statement is illuminated by photographs of the roofs of these two districts. No mention is made of Charing Cross Hospital being situated in the Strand district.

The statements as to the cure of cancer are deserving of severe condemnation. Only the harm the book may do has justified any notice being taken of it. It is with regret that the reviewer feels obliged to judge thus harshly what the perusal of the book proves has been a labour of love, carried out with the best intentions; but the pursuit of a hobby ought not to be encouraged to the public danger.

E. J. B.

The Socialized Conscience. By Prof. J. H. Coffin. Pp. viii + 247. (Baltimore: Warwick and York, 1913.) Price 1.25 dollars.

Prof. Coffin's purpose in this interesting book is to suggest, using modern psychological and sociological terms, a moral criterion by means of which the different types of moral situations may be met with consistency by ordinary human beings. He applies the criterion to a great variety of questions, including personal relationships, educational agencies, the State and the Church. His chapters are stimulating and thought-impelling.

Descriptions of Land: a Text-book for Survey Students. By R. W. Cautley. Pp. ix + 89. (New York: The Macmillan Company, 1913.) Price 4*s*. 6*d*. net.

All students of surveying in Canada before securing official recognition are required to pass an examination on "descriptions of land," which is one branch of conveyancing. Many lawyers in all countries are ignorant of the elementary principles of surveying, and few surveyors are able to understand the intricacies of a complicated title. Mr. Cautley has written on the subject in a way which should be useful, not only to students of surveying, but also to acting lawyers and surveyors everywhere.

Elementary Commercial Geography. By Dr. H. R. Mill. Revised by Fawcett Allen. Pp. xii + 215. (Cambridge University Press, 1914.) Price 1*s*. 6*d*. net.

Dr. Mill's primer of commercial geography was published first in 1888, and is well known to all teachers of the subject. It is sufficient to say of the latest edition that it has been revised thoroughly by the aid of the latest official publications, and is enlarged by additions to part i., and by more detailed descriptions of countries which have shown recent commercial development.

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